What is claimed is:

1. An apparatus for treating wastewater comprising:

a physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor;

a clarifier operably connected to and located downstream of the physical-chemical reactor;

a ballast recirculation line operably connected between the clarifier and the physical-chemical reactor; and

a control system that directs

unconditioned influent into the clarifier when influent conditions are within a selected range, and

conditioned influent, resulting from direct or indirect introduction of chemicals and recirculated ballast generated within the clarifier, into the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range.

2. The apparatus of Claim 1, wherein the chemical supply comprises a coagulant supply and/or a flocculant or other reagent supply.

3. An apparatus for treating wastewater which operates without ballast material supplied from outside comprising:

a physical-chemical reactor which operates without ballast material supplied from outside;

a chemical supply, free of ballast material supplied from outside, operably connected to the physical-chemical reactor;

a clarifier operably connected to and located downstream of the physical-chemical reactor which operates without ballast material supplied from outside; and

a control system that directs

unconditioned influent into the clarifier when influent conditions are within a selected range, and

conditioned influent, resulting from direct or indirect introduction of chemicals and recirculated ballast generated within the clarifier, into the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range.

4. The apparatus of Claim 3, wherein the chemical supply comprises a coagulant supply and/or a flocculant or other reagent supply.

5. An apparatus for treating wastewater comprising:

one physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor;

a clarifier operably connected to and located downstream of the physical-chemical reactor; and

a control system that directs

unconditioned influent into the clarifier when influent conditions are within a selected range, and

conditioned influent, resulting from direct or indirect introduction of chemicals and recirculated ballast generated within the clarifier, into the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range.

6. The apparatus of Claim 5, wherein the chemical supply comprises a coagulant supply and/or a flocculant supply.

7. An apparatus for treating wastewater comprising:

a physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor;

a clarifier operably connected to and located downstream of the physical-chemical reactor;

a ballast recirculation line operably connected between the clarifier and the physical-chemical reactor; and

a control system that directs

a) influent into the clarifier when influent conditions are within a selected range, and

b) chemicals, either directly or indirectly, and influent into the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range, and

c) ballast generated within the clarifier into the physical-chemical reactor through the ballast recirculation line when the influent conditions are within the selected different range.

8. The apparatus of Claim 7, wherein the chemical supply comprises a coagulant supply and/or a flocculant or other reagent supply.

9. An apparatus for treating wastewater which operates without introducing ballast material supplied from outside comprising:

a physical-chemical reactor which operates without introducing ballast material supplied from outside;

a clarifier operably connected to and located downstream of the physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor which operates without introducing ballast material supplied from outside; and

a control system that directs

a) influent into the clarifier when influent conditions are within a selected range, and

b) chemicals, either directly or indirectly, and influent into the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range.

10. The apparatus of Claim 9, wherein the chemical supply comprises a coagulant supply and/or a flocculant or other reagent supply.

11. An apparatus for treating wastewater comprising:

one physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor;

a clarifier operably connected to and located downstream of the physical-chemical reactor; and

a control system that directs

a) influent into the clarifier when influent conditions are within a selected range, and

b) chemicals, either directly or indirectly, and influent into the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range.

12. The apparatus of Claim 11, wherein the chemical supply comprises a coagulant supply and/or a flocculant supply.

13. An apparatus for treating wastewater, comprising:

a physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor which introduces chemicals, either directly or indirectly, when the influent conditions are within a selected range and does not introduce chemicals into the physical-chemical reactor when the influent conditions are within a selected different range;

a clarifier operably connected to and located downstream of the physical-chemical reactor; and

a ballast recirculation line operably connected between the clarifier and the physical-chemical reactor which introduces ballast generated in the clarifier into the physical-chemical reactor when the influent conditions are within the selected different range.

14. The apparatus of Claim 13, wherein the chemical supply comprises a coagulant supply and/or a flocculant or other reagent supply.

15. An apparatus for treating wastewater which operates without ballast material supplied from outside comprising:

a physical-chemical reactor which operates without ballast material supplied from outside;

a chemical supply operably connected to the physical-chemical reactor which introduces chemicals into the physical-chemical reactor, either directly or indirectly, when the influent conditions are within a selected range and does not introduce chemicals into the physical-chemical reactor when the influent conditions are within a selected different range; and

a clarifier operably connected to and located downstream of the physical-chemical reactor which operates without ballast material supplied from outside.

16. The apparatus of Claim 15, wherein the chemical supply comprises a coagulant supply and/or a flocculant or other reagent supply.

17. An apparatus for treating wastewater comprising:

one physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor which introduces chemicals into the physical-chemical reactor, either directly or indirectly, when the influent conditions are within a selected different range and does not introduce chemicals into the physical-chemical reactor when the influent conditions are within a selected different range; and

a clarifier operably connected to and located downstream of the physical-chemical reactor.

18. The apparatus of Claim 17, wherein the chemical supply comprises a coagulant supply and/or a flocculant supply.

19. An apparatus for treating wastewater comprising:

a physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor;

a clarifier operably connected to and located downstream of the physical-chemical reactor;

a ballast recirculation line operably connected between the clarifier and the physical-chemical reactor; and

a control system that directs

a) influent into 1) the clarifier but not the physical-chemical reactor when influent conditions are within a selected range and 2) the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range,

b) ballast generated within the clarifier into the physical-chemical reactor through the ballast recirculation line when the influent conditions are within the selected different range, and

c) chemicals to the physical-chemical reactor, either directly or indirectly.

20. An apparatus for treating wastewater which operates without introducing ballast material supplied from outside comprising:

a physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor;

a clarifier operably connected to and located downstream of the physical-chemical reactor; and

a control system that directs

a) influent into 1) the clarifier but not the physical-chemical reactor when influent conditions are within a selected range and 2) the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range, and

b) chemicals to the physical-chemical reactor, either directly or indirectly, when the influent conditions are within the selected different range.

21. An apparatus for treating wastewater comprising:

one physical-chemical reactor;

a chemical supply operably connected to the physical-chemical reactor;

a clarifier operably connected to and located downstream of the physical-chemical reactor; and

a control system that directs

a) influent into 1) the clarifier but not the physical-chemical reactor when influent conditions are within a selected range and 2) the physical-chemical reactor and then into the clarifier when the influent conditions are within a selected different range, and

b) chemicals to the physical-chemical reactor, either directly or indirectly, when the influent conditions are within the selected different range.

22. A method of treating a variable flow of wastewater comprising:

removing selected solid materials from the wastewater;

during a normal flow or pollutant loading of wastewater, subjecting the wastewater to clarification in a clarifier; and

during high influent conditions, 1) adding coagulant and/or flocculant to the wastewater, 2) recirculating ballast generated within the clarifier into the resulting mixture, 3) subjecting the resulting mixture to agitation in a physical-chemical reactor, and 4) subjecting the resulting mixture to settling in the clarifier.

23. A method of treating a variable flow of wastewater comprising:

removing selected solid materials from the wastewater;

during a normal flow or pollutant loading of wastewater, subjecting the wastewater to clarification in a clarifier; and

during high influent conditions, 1) adding coagulant and/or flocculant and/or other reagents to the wastewater, 2) subjecting the resulting mixture to agitation in a single physical-chemical reactor, and 3) subjecting the resulting mixture to settling in the clarifier.

24. A method of treating a variable flow of wastewater comprising:

removing selected solid materials from the wastewater;

during a normal flow or pollutant loading of wastewater, subjecting the wastewater to clarification in a clarifier; and

during high influent conditions and without introducing ballast material supplied from outside, 1) adding coagulant and/or flocculant and/or other reagents to the wastewater, 2) subjecting the resulting mixture to agitation in a physical-chemical reactor, and 3) subjecting the resulting mixture to settling in the clarifier.